NOAA Research in Florida

FL-1 through 23 (Based in Gainesville - serves the entire state)

National Sea Grant College Program
Florida Sea Grant College Program

The Florida Sea Grant College Program, part of the National Sea Grant College Program, is the only university-based coastal research, education, extension/outreach, and communications program of its kind in the state. Hosted by the University of Florida, Sea Grant is a partnership program among Florida's universities, NOAA, and Florida's citizens, industry, and governments. Florida Sea Grant's mission is to enhance the practical use and conservation of coastal and marine resources to create a sustainable economy and environment. The program focuses research in three strategic areas: 1) providing economic leadership for marine biotechnology, fisheries, aquaculture, seafood safety and water-dependent businesses; 2) enhancing coastal ecosystem health and public safety related to water quality, coastal habitat and coastal hazards; and, 3) creating a highly trained workforce and scientifically and environmentally informed citizenry. Current research projects are targeting the development of marine bioproducts, aquaculture techniques for marine ornamentals and consumable seafoods, modeling and production management techniques for fisheries management, improving the product quality and safety of Florida's seafood products, and developing science-based management practices for both coastal habitat and water quality. From 1999-2001, faculty and students at twelve of Florida Sea Grant's fifteen core institutions have received federal Florida Sea Grant funds based on highly competitive awards (Florida A&M University, Florida Atlantic University, Florida State University, Florida International University, University of Central Florida, University of Florida, University of South Florida, University of Miami, Nova Southeastern University, Florida Institute of Technology, Mote Marine Laboratory, and Harbor Branch Oceanographic Institution). In conjunction with its research, Florida Sea Grant also provides support to graduate students; since 1997, 23 graduate students per year have received assistantship support. Citizens, industry and policy makers are kept informed on a variety of marine and coastal issues, ranging from safe navigation to seafood quality and safety, through a cadre of more than 20 marine extension agents and specialists serving the 35 coastal counties of Florida. In FY 2001, Florida Sea Grant projects received approximately $2.7 million from the National Sea Grant College Program. For more information please visit http://www.flseagrant.org

FL-1 through 23 (Statewide)

Climate and Global Change Program

NOAA is responsible for providing climate information to the nation in order to prepare and protect climate sensitive sectors of society and the economy. To carry out this mission, NOAA's Climate and Global Change Program conducts focused scientific research to understand and predict variations of climate. The Program is comprised of a number of research elements, each focusing on a specific aspect of climate variability. Taken together, this research contributes to improved predictions and

assessments of the effects of climate variability and change on different environments over a continuum of time scales from season to season, year to year, and over the course of a decade and beyond. This research is accomplished through the strong support of the academic and private sectors, as well as NOAA and other federal laboratories. In FY 2001, NOAA's Climate and Global Change Program provided approximately $3.2M in support of climate research in the State of Florida. For more information please visit http://www.ogp.noaa.gov

FL-1 through 23 (Statewide)

Atlantic Oceanographic and Meteorological Laboratory
Hurricane Research

The Hurricane Research Division (HRD) of the Atlantic Oceanographic and Meteorological Laboratory conducts an annual field program during peak hurricane season, flying NOAA's two WP-3D Hurricane Hunter aircraft into all hurricanes threatening US coastlines. Dropsondes and onboard radar are used to profile hurricane winds and storm structure. HRD scientists then transmit real-time information to the National Hurricane Center (NHC) at the Tropical Prediction Center, one of NOAA's National Centers for Environmental Prediction (NCEP). An HRD workstation at NHC processes the aircraft data to generate products for hurricane specialists. NOAA's G-IV jet is also used in the field program to profile wind currents surrounding and influencing the storm's track. HRD scientists incorporate these and other data to create wind analyses of hurricanes. These analyses are crucial in identifying regions of strong winds in the storm and are distributed to local emergency managers for hurricane warning and evacuation determinations. HRD scientists are also studying the characteristics of hurricane winds before and after landfall to help determine expected wind impacts as a hurricane moves over land. For more information please visit
http://www.aoml.noaa.gov/hrd/index.html

FL-1 through 23 (various aquatic environments)

Great Lakes Environmental Research Laboratory
Environmental Research

A Great Lakes Environmental Research Laboratory (GLERL) scientist is examining habitat-mediated predator-prey interaction and implications for sustainable production of gag grouper in the eastern Gulf of Mexico. This collaborative project, with two University of Florida scientists, seeks to determine why gag grouper prefer larger reef structures, yet grow faster and are more robust on smaller reefs. GLERL also participates in a multi-agency collaboration with the Argonne National Laboratory, the U.S. Geological Survey – St. Petersburg, the University of Michigan, and Woods Hole Oceanographic Institution. The study aims at reconstructing the ecological and biogeochemical changes that occurred in Florida Bay during the 20th century. GLERL is part of a collaborative effort that focuses on using 137Cs core dating techniques to document and understand long-term changes in phosphorus availability, corresponding vegetational changes, and ensuing wildlife habitat degradation related to soil accretion rates in South Florida wetlands. For more information please visit http://www.glerl.noaa.gov

FL-1, 2, 4, 5, 7, 9, 10, 13, 14, 15, 16, 17, 18, 20, 22, and 23 (coastal waters)

National Undersea Research Program
National Undersea Research Center for the Southeastern U.S. and Gulf of Mexico

The National Undersea Research Center for the Southeastern U.S. and Gulf of Mexico is located at the University of North Carolina at Wilmington. It is one of six regional centers supported by the National Undersea Research Program. The center supports and conducts research throughout the South Atlantic Bight, Florida Keys, and Gulf of Mexico. The Center provides research support for in situ oceanography conducted by divers, submersibles and remotely operated vehicles. Key research includes studies of the health of coastal reef systems in the Florida Keys, studies of marine fisheries population dynamics/habitat associations/recruitment processes, support of research on lithospheric resources and processes (including those related to offshore oil drilling, gas hydrates, climate change, sea level history, and sea floor evolution) and carbon cycling as it concerns the air-sea interaction in global warming. The Center currently supports Aquarius, the world's only undersea laboratory. Located 20 meters below the surface in the Florida Keys National Marine Sanctuary, Aquarius serves as laboratory and habitat for crews of aquanaut-scientists who stay for up to two weeks at a time conducting research in the nearby coral reef ecosystem. In FY 2001, the Center received funding of $2.64 million. For more information please visit http://www.uncwil.edu/nurc/

FL-2 (Tallahassee)

Climate and Global Change Program
Center for Ocean Atmosphere Predictions Studies

NOAA's Climate and Global Change Program provides support for the Center for Ocean Atmosphere Predictions Studies (COAPS) at Florida State University. COAPS performs research in air-sea-interaction, ocean and coupled air-sea modelling, climate prediction on scales of months to decades, statistical studies and predictions of social economic consequences of the ocean-atmospheric variations. For more information please visit http://www.coaps.fsu.edu

FL-2 (Tallahassee)

Air Resources Laboratory
Integrated Surface Irradiance Study

Solar radiation is the driving energy for the geophysical and biochemical processes that control weather and life on earth, so understanding the global surface energy budget is key to understanding climate. Because it is impractical to cover the earth with monitoring stations, the answer to global coverage lies in reliable satellite-based estimates. Accurate and precise ground-based measurements in differing climatic regions are essential to refine and verify the satellite-based estimates, as well as to support specialized research. The Integrated Surface Irradiance Study (ISIS) is a continuation of earlier NOAA surface-based solar monitoring programs in the visible and ultraviolet wavebands. ISIS provides basic surface radiation data with consistency and accuracy. The Air Resources Laboratory operates the NOAA national broadband solar radiation network, including a station located in Tallahassee that monitors incoming radiation. For more information please visit http://www.atdd.noaa.gov

FL-2, 5, and 18 (Tallahassee, Gainesville, and Miami)

Climate and Global Change Program
Florida Consortium for Regional Assessment of Climate Variability

NOAA's Climate and Global Change Program provides support for the Florida Consortium for Regional Assessment of Climate Variability. The Florida Consortium is a collaborative effort involving the Center for Ocean-Atmospheric Prediction Studies (COAPS) at the Florida State University, the Institute of Food and Agricultural Sciences (IFAS) at the University of Florida, and the Rosenstiel School for Marine and Atmospheric Science (RSMAS) at the University of Miami. The Florida Consortium seeks to identify regions susceptible to climate variability, assess the vulnerability of agriculture and production systems in these regions, and develop strategies to cope with climate change. For more information please visit http://www.coaps.fsu.edu/lib/Florida_Consortium/

FL-3 (Jacksonville)

Aeronomy Laboratory and the Atlantic Oceanographic and Meteorology Laboratory
Fourth Convection and Moisture Experiment

NOAA scientists participated in the Fourth Convection and Moisture Experiment (CAMEX-4), a field experiment that involved NOAA scientists from the Aeronomy Laboratory and the Atlantic Oceanographic and Meteorology Laboratory, as well as scientists from the National Aeronautics and Space Administration (NASA), other agencies, and academia. The mission, based out of Jacksonville in August and September of 2001, involved "overflights" of hurricanes by the NASA ER-2 high altitude research aircraft to study the processes associated with hurricane development and evolution. The Aeronomy Lab's involvement added a "chemistry" perspective to the CAMEX-4 mission. Aeronomy Lab instruments measured ozone and water vapor as the aircraft flew through the upper troposphere and lower stratosphere. The measurements will reveal how the hurricanes affect the exchange of air between the troposphere and stratosphere, which has consequent effects on the atmosphere's dynamical motions and chemical composition. Effects on the stratospheric ozone layer are one example of the areas under investigation. The 2001 hurricanes Erin, Gabrielle, and Humberto were studied during the Experiment. For more information please visit http://camex.msfc.nasa.gov

FL-9, 10, 11, and 13 (Tampa Bay watershed)

Air Resources Laboratory
Atmospheric Transport Studies

In 2000, the NOAA Air Resources Laboratory, working with colleagues in the U.S. EPA and the Florida Department of Environmental Protection investigated the importance of long-range transport of reactive gaseous mercury in the marine atmosphere. Using the NOAA Twin Otter aircraft, vertical profiles of various mercury compounds and other trace gases were measured off the South Florida coast. In 2002, similar aircraft studies are being planned to characterize the transport of nitrogen compounds and other trace gas compounds to the Tampa Bay watershed. These studies are a part of a larger state effort to characterize the effects of mercury, nitrogen, and other compounds on the Florida environment. For more information please visit http://www.arl.noaa.gov

FL-11, 15, and 20 (MacDill AFB, Cape Canaveral, and Key West)

Forecast Systems Laboratory
GPS Meteorological Observing Systems

NOAA's Forecast Systems Laboratory (FSL) operates a rapidly expanding network of GPS Meteorological (GPS-Met) Observing Systems to monitor the total quantity of precipitable water vapor in the atmosphere. Currently, there are 93 systems over the contiguous 48 states and Alaska, and plans are being made to extend these observations to Hawaii, Puerto Rico, the Caribbean Islands, and Central America. Water vapor is an important but under-observed component of the atmosphere that plays a major role in severe weather events and the global climate system. GPS-Met systems provide accurate water vapor measurements under all weather conditions, including thick cloud cover and precipitation, and do so at very low cost. The network is being developed by FSL in cooperation with federal, state and local government agencies, universities, and the private sector. The GPS stations provide high-accuracy surveying and navigation services for National defense, automated agriculture, safe land and marine transportation, government infrastructure management, and 911 emergency response services. Fortuitously, these systems can also be used for meteorology with the addition of surface weather sensors. GPS-Met systems located in Florida include sites operated by the U.S. Coast Guard near Key West, Cape Canaveral, and MacDill AFB, with one planned near Miami. The Florida Department of Transportation is also establishing 45 GPS sites throughout the state in the next few years that will be incorporated into the GPS-Met Network. For more information please visit http://www.gpsmet.noaa.gov/jsp/index.jsp

FL-11 (Tampa)

Aeronomy Laboratory
Cloud Research

In July through November of 2001, Aeronomy Laboratory scientists conducted a series of flights (out of MacDill Air Force Base) on the NOAA Gulfstream-IV aircraft during the G-IV's fall hurricane-season missions. Lab researchers "piggy-backed" their instrument for measuring radiative properties of clouds on the G-IV's usual payload, thereby seizing an ideal opportunity to collect additional atmospheric data on the already-planned flights. As the aircraft flew above clouds, the instruments looked downward and measured radiation reflected off of the clouds in the 425-1050 nanometer wavelength range (in the visible and near-infrared region). Detailed analysis of the reflected light signals in that spectral range are used as a diagnostic of how the cloud absorbed the original incoming solar radiation. The ultimate aim of the research is to gain a better understanding of the radiation that is reflected off of clouds, an important parameter in the earth's radiation budget that has consequences for climate. For more information please visit http://www.al.noaa.gov

FL-11 (Tampa Bay)

Air Resources Laboratory
Atmospheric Integrated Research Monitoring Network

AIRMoN, or Atmospheric Integrated Research Monitoring Network, is an array of sampling stations designed to quantify the extent to which changes in emissions affect air quality and deposition.

NOAA's Air Resources Laboratory operates both elements of the network, AIRMoN-Wet and AIRMoN-Dry. AIRMoN-Wet collects data on the deposition of pollutants that occurs with precipitation. Daily samples of precipitation are collected at ten stations throughout the country and then sent to a single central laboratory for chemical analysis. Prime users of these data include ecologists, agriculturists, foresters, and power companies affected by Clean Air Act legislation. An AIRMoN-Wet station is located in Florida in Tampa Bay. For more information please visit http://www.arl.noaa.gov/research/programs/airmon.html

FL-14, 16, 17, 18, 20, 22, 23 (South Florida coastline)

Atlantic Oceanographic and Meteorological Laboratory
South Florida Bay Ecosystem Restoration Prediction and Modeling Program

The South Florida Bay Ecosystem Restoration Prediction and Modeling Program seeks to provide requisite understanding of Florida Bay and the adjacent coastal ecosystems to which it is connected to support South Florida Ecosystem Restoration decision-making. Within the Interagency Florida Bay Science Program, scientists from NOAA's Atlantic Oceanographic and Meteorological Laboratory (AOML) conduct and support a variety of research and modeling projects that complement those of our agency partners. Drawing upon NOAA's unique institutional strengths and emphasizing its jurisdictional mandates, including the dissemination of data and model output realizations, AOML is working toward the timely prediction of environmental consequences of alternative restoration projects for the South Florida Ecosystem Restoration management community. For more information please visit http://www.aoml.noaa.gov/ocd/sferpm/

FL-15 (Kennedy Space Center)

Environmental Technology Laboratory
Cloud Radar

NOAA's Environmental Technology Laboratory is using its scanning K_a-band Doppler radar to observe clouds before shuttle launches at Kennedy Space Center to better define the altitudes, thicknesses, and structures of cloud layers in the launch vicinity. This new way of looking at clouds will help assess whether NASA's current launch window restrictions on cloud conditions have been applied properly or too conservatively. Ultimately, current technologies for observing regional clouds for launch decisions may be replaced with technology similar to NOAA's, particularly if the radar's polarization data also prove useful in assessing the electrification of clouds (potential for lightning). For more information please visit http://www.etl.noaa.gov

FL-16, 17, 18, 20, 22, 23 (Southeast Florida coastline)

Atlantic Oceanographic and Meteorological Laboratory
Dredged Materials Transport Studies

The Atlantic Oceanographic and Meteorological Laboratory is currently carrying out research programs designed to protect environmentally valuable coral reefs and other near-shore environments in southeast Florida, while at the same time allowing economically necessary dredging

activities to proceed at the Ports of Miami and Ft. Pierce. The Port of Miami is a vital economic engine for Florida, contributing more than 12 billion dollars annually, directly and indirectly, to the State of Florida and providing thousands of jobs. Ongoing studies identify the potential for adverse impacts on nearby reefs and coastal habitats due to the short and long-term transport of disposed dredge material from offshore sites. Dredged materials disposed on offshore sites may create plumes of fine sediments that may be transported to inshore reef habitats, with ecological and highly significant local economic impact. For more information please visit http://www.aoml.noaa.gov/oad/

FL-16, 17, 18, 20, 22, 23 (Southeast Florida coastline)

Atlantic Oceanographic and Meteorological Laboratory
Current Measurements

Transport variations in the Florida Current are continually monitored by scientists at the Atlantic Oceanographic and Meteorological Laboratory by measuring the cross-stream voltages using an in-service cable between West Palm Beach, Florida, and Eight Mile Rock, Grand Bahama Island. An abandoned second cable is also being studied between Key West, Florida, and Havana, Cuba. Fifteen years of these voltage-derived transport measurements from the cables have been collected. The data are being used in models of the circulation off the East Coast of the United States, and to evaluate numerical models being developed for climate studies. The current studies are also used in relation to transport of off-shore dredge disposal and dilution rates of material disposed into the current. For more information please visit http://www.aoml.noaa.gov

FL-16 (Fort Pierce)

Ocean Exploration

In 2001, with a $4 million appropriation from Congress, NOAA launched a systematic, strategic effort through the Office of Ocean Exploration to search and investigate the oceans for the purpose of discovery. The Harbor Branch Oceanographic Institution in Fort Pierce played a key role in the Islands in the Stream Voyage which explored coral reefs and hard bottom communities from Belize to the Southeastern United States. Operations included manned submersible and remotely operated vehicle (ROV) collection of oceanographic data for research including surface, mid-water and bottom sampling. For more information please visit http://www.oceanexplorer.noaa.gov

FL-18 (Miami)

Atlantic Oceanographic and Meteorological Laboratory

NOAA's Atlantic Oceanographic and Meteorological Laboratory (AOML) headquartered in Miami, carries out a wide range of science to fulfill NOAA's research mission. AOML conducts a basic and applied research program in oceanography, tropical meteorology, atmospheric and oceanic chemistry, and acoustics. AOML's research program seeks to understand the physical characteristics and processes of the ocean and the atmosphere, both separately and as a coupled system. AOML scientists study hurricanes, ocean current and temperature structures, ocean/atmosphere chemical exchanges, and the coastal ocean by using research ships and aircraft, satellite remote sensing

techniques, numerical and statistical models, radar, acoustics, and drifting buoys. Currently, AOML is working to improve the health of coastal ecosystems, advance short-term warnings and forecast services, implement seasonal-to-interannual climate forecasts, predict and assess decadal-to-centennial climate changes, and build sustainable fisheries. AOML is a $15.8 million laboratory ($8.6 million in NOAA base), with 150 staff, including 101 federal employees and 52 non-Federal employees, including 38 university employees. For more information please visit http://www.aoml.noaa.gov

FL-18 (Miami)

Cooperative Institute for Marine and Atmospheric Studies

The Cooperative Institute for Marine and Atmospheric Studies (CIMAS) in Miami is a research institute of the University of Miami in partnership with NOAA. CIMAS serves as a mechanism to bring together the research resources of the University with those of NOAA in order to develop a center of excellence in research that is relevant to understanding the Earth's oceans and atmosphere within the context of NOAA's mission. CIMAS carries out research in six theme areas: Climate Variability; Fisheries Dynamics; Regional Coastal Ecosystem Processes; Human Interactions with the Coastal Environment; Air-Sea Interactions and Exchanges; Integrated Ocean Observations. CIMAS is also heavily involved in the South Florida Ecosystem Restoration (SFER) program. SFER aims to rectify the ecological damage done to South Florida and the Everglades because of water diversion projects carried out over the past 100 years, largely to mitigate flood damage from hurricane rains. In the coming years CIMAS and the local NOAA laboratories will play an increasingly important role in South Florida programs. CIMAS currently supports approximately 65 university researchers, postdoctoral students, graduate students, and staff. In FY 2001, CIMAS received approximately $5.3 million in NOAA funding. For more information please visit http://www.rsmas.miami.edu/groups/cimas/

FL-20 (Florida Everglades)

Air Resources Laboratory
Atmospheric Mercury Studies

NOAA's Air Resources Laboratory (ARL) has been working with scientists from the Oak Ridge National Laboratory (ORNL) to develop a technique for measuring the flux of gaseous mercury to and from various surface types. The technique has been steadily refined over the last several years and applied at several locations within the U.S. and abroad. One source of atmospheric mercury is fossil fuel combustion, and the resulting gaseous mercury can travel for large distances. Its transfer to the surface and possible later emission back to the atmosphere depends on the surface characteristics, the local surface chemistry, and temperature. ORNL and the Atmospheric Turbulence and Diffusion Division of ARL have been working with Florida officials to determine the flux of mercury over the Florida Everglades requiring NOAA's Gulf Stream IV-SP, WP-3D and Twin Otter aircraft. The Twin Otter, in particular, has been used several times in continuing studies of air pollution and its effects on the Florida environment. A recent intensive study (in collaboration with the EPA) brought together scientists from ARL and a number of universities in a study to identify the origins of mercury affecting the Florida Everglades. For more information please visit http://www.arl.noaa.gov

FL-20 (Florida Keys and Florida Bay)

Atlantic Oceanographic and Meteorological Laboratory
Environmental Monitoring

Since 1992, a network of 7 monitoring stations in the Florida Keys and Florida Bay has been established through a cooperative effort between the Atlantic Oceanographic and Meteorological Laboratory (AOML) and the Florida Institute for Oceanography. These stations monitor and report meteorological and oceanographic parameters from their locations. The data is used by the Florida Keys National Marine Sanctuary and research scientists to monitor and study coral-reef-related issues such as coral bleaching. AOML scientists have also begun establishing a new network of Coral Reef Early Warning Systems (CREWS) at 20 coral reef sights in U.S. waters in both the Atlantic and the Pacific. The CREWS stations use innovative technology and programming to assess physical parameters and send out warnings of coral bleaching events in advance of the onset of bleaching. For more information please visit http://coral.aoml.noaa.gov

FL-22 (Palm Beach Gardens)

National Undersea Research Program
Caribbean Marine Research Center

The National Undersea Research Center for the Caribbean is located at the Caribbean Marine Research Center (CMRC) in Palm Beach Gardens. It is one of six regional centers supported by the National Undersea Research Program (NURP). The Center supports and conducts undersea research throughout the entire Caribbean region. Major research projects have dealt with fisheries ecology, fisheries oceanography, the influence of physical oceanographic processes on larval transport and recruitment, coral reef ecology, predator-prey dynamics, paleo-oceanography, the impact of subsurface ultraviolet light in marine environments, marine aquaculture and long-term monitoring of oceanographic and meteorological conditions. These studies have focused on a variety of commercially and ecologically important species including Nassau grouper, queen conch, Caribbean spiny lobster, corals, reef fishes, and invertebrates. It provides research support facilities at Lee Stocking Island, Bahamas, chosen for its pristine environments and easy access to diverse coastal ecosystems, and does work throughout the Caribbean. The FY 2001 funding for the Center totaled $1.34 million. For more information please visit http://www.cmrc.org

For further information about these and other NOAA programs, please contact NOAA's Office of Legislative Affairs at (202) 482-4981.

February 2002